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ABSTRACT

During the 1994 fall semester, an instructor taught an English 101 section at Central Arizona College-Superstition Mountain Campus that used readings from Graham Flegg's "Numbers: Their History and Meaning" as the basis for 3 of the assigned readings. Only 3 of the 5 assigned essays were based on math--as opposed to all of them--for several related reasons: (1) the degree of difficulty of such assignments for beginning composition students; (2) the belief that not all of the composition students would improve as writers if they felt completely alienated by the essay subject matter (an all-math class); and (3) the sense that retention in the class would suffer if students were not allowed to write an equal number of essays dealing with more "language-friendly" subject areas (history, culture, sociology). Although the students were never completely comfortable with the idea of writing about math and the plaintive request for "regular English essays" was heard frequently, the outcome was generally successful. The class came to realize that written composition can be an effective tool in areas other than literature-based or personal narrative pieces of writing. However, the intellectual difficulty of the assignments may have impeded the students' ability to improve their writing processes and grammatical/syntactical skills. (Contains student responses to the math agenda at various points in the semester, sample writing assignments, and a student writing sample.) (TB)

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ED 387 815

Final Report

Writing about Math in English 101

A Title III Funded Learning Community Project

at Central Arizona College-Superstition Mountain Campus

December 14, 1994

Jeffrey Ross, Professor of English
Dixon Faucette, Professor of Mathematics

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December 14, 1994

Final Report for Title III Teaching Team Projects

by Jeffrey Ross, Ed.D.

English 101/Math at Central Arizona College-Superstition Mountain Campus.

Introduction

During the 1994 fall semester, I taught an English 101 section at CAC-SMC that used readings from Graham Flegg's Numbers: Their History and Meaning as the basis for three essays. In the original plan, I proposed that we would write five (5) essays related to math topics in the Math/English 101. I made the decision to have the students write only three math-based essays for several related reasons: a) the degree of difficulty of such assignments for beginning composition students; b) my belief that not all of the comp students would improve as writers if they felt completely alienated by the essay subject matter (an all-math class); and c) my sense that retention in the class would suffer if students were not allowed to write an equal number of essays dealing with more "language-friendly" subject areas (history, culture, sociology).

My Reactions

This was a pilot project. I was generally pleased with its outcomes. The students were never completely comfortable with the idea of writing about math; I frequently heard the plaintive request for "regular English essays." We spent several minutes each week discussing what regular English essays might be. I think the class finally came to realize that written composition can be an effective learning tool in areas other than literature-based or personal narrative pieces of writing.

I believe that the intellectual difficulty of the assignments (the amount of thinking required) may have impeded the students' ability to improve their writing process and grammatical/syntactical skills. We spent a great deal of time discussing the math-based assignments in class; they spent even more time outside of class struggling with the Flegg readings and the assignments. They were asked to think about numbers in new ways and their emerging math awareness came at a cost.

On several occasions, in the Teaching/Learning Center, I noticed groups of five to ten students from the class gathering in study groups/hermeneutic circles discussing the meaning of math and numbers. I was genuinely impressed with their enthusiasm and interest in the readings and assignments. I have never witnessed such "scholarly" debates among composition students in my 16 years of teaching. They were "teaching" each other.

At the end of the semester, I was convinced that students can become more comfortable with math by writing about it. I believe this was a successful project, and it has changed the way I view teaching composition and the way I view numeracy.

Attachments

I have also attached copies of the brief evaluative comments students were asked to write at the beginning, middle, and end of the semester. (These comments are unedited except for spelling)

I have attached a copy of a representative student essay.

Title III Learning Community Project
First Math & English Update

September 9, 1994
Jeff Ross & Dixon Faucette, SMC

English 101 Section JM student responses to the following prompt September 9, 1994:

I have explained how parts of this course will deal with reading and writing about math. We have previewed Graham Flegg's book Numbers: Their History and Meaning and the writing assignments. What is your reaction? Write a sentence or two.

1. The number assignments I feel is going to be real tough. Having to write about numbers and to know what the words mean could be important.

2. I think it is strange to write an essay on math. How interesting can a book on math be.

3. I'm not too sure how the math essays are going to turn out. I know I'm not a very good math student so I hope this won't affect my essays.

4. Math is not my favorite subject in the first place, so I am not too excited about writing an essay on it. I think it will be a lot harder than just reading a story and writing an essay on a question about the story. But I guess I will see how I do when the time comes to write a math essay.

5. I don't know what exactly the essay will entail and its going to be interesting. If it has anything to do with math problems and solutions, I hope it's basic.

6. I think this is dumb because I don't care were numbers came from, and there history.

7. I think that writing about math can be interesing as long as it's not to hard. I think I'll learn something from it.

8. I felt at first, it was kind of dumb then when I read the first chapter it seems interesting. I feel that the math essays will give me a better understanding in math.

9. I think that this math essay will be a fun assignment. I beleave it will not only help or writing skills, but it with also help us to see math in a different way.

10. Well perhaps it'll be an educational experience. But personally I hope I can stay awake long enough to read it. I personally dislike math because it take to long to do it, calculators save time but I can always think of better things to do than math. So I guess basically this is a wast of time. I'd rather do regular essays.

11. I have no idea why we have to write an essay on numbers. I was kind of confused when we had to write about numbers in English class. I don't know what numbers have to do with English Class.

12. I hope I will enjoy it but I probably won't enjoy it since it involves math! If the papers are not to long, I will try to have fun with these math essays.

13. I'm not sure how to understand this, since I've never had to write about math in English class. But I guess that having different kinds of topics is a imagination builder.

14. I believe this is a Heck of an Idea. I was always terrible at math and this might help me understand It better. Although it will be good for me It is also going to be rather boring but nobody ever died from being bored. (At least I hope not.)

15. Math is my favorite subject in school, so I don't mind writing about it too much. I would rather write about math class than have to write in math class. I don't think it will be too bad, but what is the purpose?

16. I think if I really wanted to know more about or write about numbers I'd do it on my own. Writing about numbers makes as much sense to me as putting water in the oil pan of your car and is about as interesting as watching a turntable for hours on end.

17. I could think of better things to write about. Math is not one of my stronger subjects. It would be much easier to write about something more comprehensive to me.

18. Writing an essay about "Numbers: Their History and Meaning" scares me to death. I avoided math this semester. I didn't think I would get it in English.

19. The essay on Numbers is just another writing assignment. The more writing experience I have the more I learn.

20. Personally I don't understand what he exactly wants us to do if he wants us to write about the student themselves or to write about math personally.

21. As your experimental group on the subject of mathematical essays, I have but on question: Will we be graded with leniency?

22. Writing essays is boring but no matter the topic skills are reinforced.

Midterm English 101/Math Update from the Superstition Mountain Campus

(This appeared in the October CAC Title III Newsletter)

Students participating in the Jeff Ross English 101/Math project wrote the rough draft of their first math-related essay the week of October 10, 1994. In preparation for the essay, they were asked to read and discuss Chapter 1 in Graham Flegg's Numbers: Their History and Meaning. (Chapter 1 deals very briefly with math concepts such as counting, ordering, number words and symbols, and time.) They were then asked to respond, in 500 words, to either one of the following directives:

1. Summarize Flegg's discussion. Then, describe your own assessment of what numbers mean or represent.
2. Does math exist without number systems? Defend your answer by using examples from the natural world.

The rough drafts of the essays were reviewed in class by peers and Dr. Ross on Friday, October 14. Just before the end of the class, Dr. Ross asked the students to write a brief reaction (1-3 sentences) to the assignment. Those short reaction statements follow:

1. This week, reading and writing aboutnumbers has been difficult. Holding thoughts together concerning numbers is a real challenge. I kept looking for a common thread to run throughout the paper. It was hard to find.

2. It was an interesting idea, "math existing without numbers," but I found it quite hard to write about.

3. Very challenging. Its hard to keep unity throughout paragraphs when I'm writing about something I don't understand. Einstein's hair would fall out trying to do this essay.

4. I am so sick of #'s. [Dixon] Faucette drives me nuts with his #'s. Then I get to write about them. I don't mind writing, in fact I like it. But why #'s?

5. After I thought about numbers for two weeks it drove me crazy. The weird part is that I had my own opinion about numbers not being in a math system but found it easy to write it the other way.

6. It still isn't my favorite subject to write about, but it was not as hard as I thought it would be. This essay was kind of confusing but the more I thought on it, the more ideas I got.

7. This assignment was really uncalled-for. It was too difficult to understand, and math and English do not mix.

8. This last week, I've been going crazy because all I think about is numbers. Math should stay in math class, not in English.

9. I find myself thinking how in the world could letters and shapes replace numbers when they are everywhere. But I have learned many different things that I did not know about the meaning of numbers and what they represent.

10. This assignment was not as hard to write about as I thought it would be So think this was a good experience for us. This essay stressed me out totally. It was very difficult for me and it frustrated me because I couldn't write like I have usually been able to. It kind of lowered my self esteem and I know the essay I wrote s-----!

11. This assignment was a good assignment. I just wished that I could put my thoughts into words. It was a tough assignment but I liked the challenge.

12. Before I started writing this paper, I knew very little about math and numbers. Presently I have so much information about numbers running through my head, I can think of little else.

13. After reading Flegg, I find myself thinking more about numbers. The essay on numbers was very hard for me.

14. This last week I haven't done homework in any other class because of numbers. I have written three different papers, each with a different view on the existence and importance of the number system in math. I am tired and confused because of this assignment-- thanks!

15. This last week I did nothing but think about how I use numbers everyday. It seemed to be very difficult to try and not to put everything into it and how to only describe certain parts.

English 101/Math Update from the Superstition Mountain Campus

November 1, 1994

During the third week of October, students participating in the Jeff Ross/Dixon Faucette English 101/Math learning community were asked to read and discuss Chapter 1 in Graham Flegg's Numbers: Their History and Meaning. (Chapter 1 deals very briefly with math concepts such as counting, ordering, number words and symbols, and time.) They were then asked to respond, in 500 words, to either one of the following directives:

1. Summarize Flegg's discussion. Then, describe your own assessment of what numbers mean or represent.
2. Does math exist without number systems? Defend your answer by using examples from the natural world.

The following is a representative essay from that assignment. Mr. David Forrester's essay (which is printed here with his permission) is in response to directive #2. (This appeared in the November CAC Title III newsletter.)

The concept of math is vague in my mind. Even with dictionary definitions, it is puzzling. Taking my best definition, I believe that math does exist without number systems. Numbers are concepts-- symbols attached to tangible objects (living or not), to organize them for our benefit.

Take, for example, a recipe. If it calls for two cups of flour, it is the quantity of flour used, not the number named two, that regulates the taste. It could just as well be said, "use x,y,z cups of flour." The end result would not be affected if the quantity of flour was the same.

In the animal world, a male and female mate and produce young. Mother nature is at work in reproduction constantly. The terms or symbols used to define these workings in no way govern the outcome. They are merely concepts by which we can organize and label what is happening.

Relationships also are a good example of math in operation without number systems. Take, for example, a husband and wife. What exists in a man and woman who have decided to form a bond and in Christian terms "Become as one." The number system says there is one man and one woman; therefore, by the property of addition, we have two people. However, the number system cannot probe the depths of the human soul and spirit. Numbers do not regulate what happens in the bond that takes place between two people; they merely give us a point of reference.

This holds true in music also. You can put three notes together and make a chord. For example, the notes C,E, and G, when played together, make the chord C. The letters are only points of reference to organize data. The fact is that on a guitar or piano, the amount of tension on a string determines the pitch or note, that is achieved. We could say that the notes W,Q and Z, make the chord R. The musical scale of A,B,C,D,E,F,G, is used for organizational purposes for us to consolidate and arrange data in a workable fashion.

However, this whole concept can become confusing to me. I no sooner finish a paragraph explaining my reasoning than I feel ridiculous at the suggestion that math could exist without a number system. Then again, what is a number? The dictionary definition is lengthy and frankly, a bit confusing. The central theme seems to involve grouping and organization.

When I read about the Godhead (or Trinity), in the Bible, it's very plain that God exists in three persons: The Father, Son, and Holy Spirit. The use of the word Trinity denotes three. However, once again in pondering this, I am aware that the term Trinity, or three, does not govern anything. God's omnipotence and omniscience, His divine ability to exist in three persons, has little to do with the concept of three. We could say the X,Y,Z instead of Trinity, and the irrefutable fact would still remain: He is God in the Father, God in the Son, and God in the Holy Spirit.

I'm still not sure I have a crystal clear picture of the concept of math and number systems. All of my life I've learned about math being made up of number systems. However, when I think about it in - depth, numbers take on a new meaning -- one that is more superficial and just more or less a tool for labeling.

Final Math/English 101 Comments-- December 13, 1994

(Students who had an A average in the course before finals week were exempted from the final exam. Incidentally, and unfortunately, they also did not write final evaluation comments.) Students responded to this directive: Give me your honest opinion about our efforts to write essays about math.

1. Doing math essays in class was very unusual because most students think they are in only to learn English. Writing about math usually grabbed me. I never knew much about the true meaning of math but writing these papers showed me that math wasn't just 9+5. I learned that math within itself has a story of its own.

2. After writing about math, it has helped me to be able to understand how and why we do need math in our system.

3. I do not believe that a math/English essay would be a bad thing to do, because essays should be written on everything. But I think that Flegg's book was very confusing to read and that is why it was harder for me to do the essays.
4. It's been very interesting learning abut the history of symbols and numbers. But I do not think I would to take an entire English class of it. It was difficult but I lived through it. I guess that's all that matters.
5. This math/English business was a good idea. But I still don't grasp the concepts of numbers.

6. I thought it was different. It wasn't bad and it wasn't good, but it did make me think about a lot of things that normally I wouldn't have thought about. So, I guess it did me a bit of good.

7. My final and honest opinion on this math/English business is one of great importance. What I mean by this is I didn't think I would enjoy the math because we were in an English class. But after writing a couple of papers, one of them not needed, I realized we were writing about math, not computing numbers. English is about writing on different subjects such as religion, art, people and math. I enjoyed this class probably more than any other...

8. I think the math was interesting and confusing. It was a pretty good experience and it helped me see math in a different perspective.

9. I have to be honest. I didn't like the math essays much. They were hard to write. I did learn a lot from them, though, and I probably wouldn't mind writing a couple of more on math.

10. Writing about numbers was stressful and very ridiculous.

11. Writing math essays in English class was not as bad as I thought, but I wouldn't want to only write essays on math. Having one or two essays on math in English class is a good idea because it helps expand your mind to all the subjects you can write on.